

NACUBO Sustainability Walking Tour

2:15-2:30 Commons Center

2:30-2:45 Hank Ingram Hall

2:45-3:00 Walk to power plant

3:00-3:15 Power Plant

3:15-3:30 Water break at Sarratt Promenade

3:30-3:45 Alumni Hall

3:45-4:00 Warren/Moore Colleges

2:15-2:30 Commons Center - LEED Gold

Outside Commons Center

- Site selection credit for rebuilding on formerly used site (Hill Center)
- Added green space to area as footprint of new building is smaller than old building
- Demolition Debris Recycling – What percentage Chelsea??
- Slate/ Flagstone steps were from bedrock blasted out during construction
- Reuse of brick
- Pervious Pavement
- Reflective Roof
- Native plantings
- Carpooling, hybrid and electric car preferred parking

Commons Center (Upstairs)

- Reuse of old library chairs
- Bathrooms – waterfree urinals, low flow / dual flush toilets, low flow faucets, green cleaning materials, low energy dryers, 40% recycled content paper products
- Building saves 900,000 gallons of water/year
- Each waterfree urinal saves approximately 40,000 gals of water each year
- Meeting rooms have CO2 sensors to change ventilation rate if occupied
- Natural lighting as much as possible – light well; control systems installed to determine when a sufficient amount of daylight is available inside the building; artificial lighting is turned off, saving energy, i.e. light harvesting
- 3rd floor shell and build-out – also LEED Gold certified

Commons Center (Downstairs)

- 2008 Governor’s Environmental Stewardship Award for excellence in green building
- Also 2009 Governor’s Environmental Stewardship Award for incorporating environmental education into freshmen experience (Commons Seminars)
- Green Screen, educational audio tour and website (LEED education credit)
- 28% energy reduction due to: inclusion of high efficiency HVAC systems, energy-efficient kitchen fume hoods, heat-reducing window glazing, and occupancy and daylight sensors
- Plaques throughout Commons Center describe green features to building occupants
- Recycling throughout
- Grey water recycling for dishwashing; hot water from the final rinse cycle of the dishwasher is used again as the ‘re-rinse’ water in the dishwasher. This saves water and energy (less water to heat!)
- Low-energy usage hoods and kitchen equipment throughout the cooking areas
- Kitchen equipment is modular: it can be disassembled, reconfigured, and repurposed
- Hard dishware, no take-away disposables dishware – meant to build culture among students
- Common Grounds: most take-out entrees come in a biodegradable or recyclable packages
- Locally-produced, organic, vegan, Kosher, vegetarian options at each meal
- Eat The World, Save The Earth Program at all VU Dining Locations advertises gluten-free options, free-range & cage free options, etc.: as well as the options previously mentioned
- Shades; windows with low-emissivity (low-e) coated glass – reflects a high percentage of radiant energy and emits a low percentage
- Drywall contains 5% post-consumer recycled content and 94% post-industrial content; steel used contains 95% post-consumer recycled content
- Recycled-content carpet
- Low or no-VOC paints, adhesives, sealants and carpets
- Cubicles have Steelcase furniture and chairs with recycled content
- Energy Star computers, monitors and vending machines
- Occupancy sensors save approximately 10% of the energy used by a building's lighting system; also control conditioned airflow
- Atrium allows as much natural lighting as possible

2:30-2:45 Hank Ingram - LEED Gold

- Opened to students in 2008 as part of the larger Ingram Commons campus

- Houses 300 First-year students
- 52% of Construction Waste Diverted from the Landfill
- 20% energy reduction from efficient mechanical systems
- Low-flow bathroom fixtures and waterfree urinals
- Atriums and stairwells allow maximum natural lighting/daylighting
- Recycled glass terrazzo floors
- Bamboo flooring and furniture used- bamboo is a rapidly renewable resource
- Low or no-VOC paints, adhesives, sealants and carpets
- 50% of materials from within 500 miles
- Reflective roofing, light colored concrete, and tree plantings to minimize urban heat effect
- Pervious pavement allows rainwater to pass through and recharge groundwater, reducing runoff
- Recycling containers in each room, and access to full recycling centers nearby

Green Lights Screen

- 2012-2013 Green Fund Project
- Computer screens display real-time energy usage for each building and tell the viewer whether or not the building is meeting its pre-determined energy saving goal
- New data is collected every five minutes for each Commons House with weekly trending plotted on a graph illustrated on the Green Lights screen in that particular House
- A red, yellow or green icon lets students know whether the building is using more or less energy than it should be, based on pre-determined energy conservation goals
- The backbone of the Green Lights program is EnergyVU, a new online energy dashboard for all campus buildings at VU not just the Commons Houses
- Users can compare the energy use of a building over a certain time period or to a set of other buildings

2:45-3:00 Walk to power plant

3:00-3:15 Power Plant

- Original plant built in early 1900's, modern structure built in 1962
- Previously fueled by coal and natural gas for 126 years
- Produces 23% of Vanderbilt's electricity, 100% of its steam for 12 million square feet of building space in VU and VUMC
 - 90% of heating
 - 40% of cooling

- Provides steam for sterilization
- Remaining 77% of electricity needs provided by Nashville Electric Service (from Tennessee Valley Authority)
- Co-generation process which produces both electricity and steam
 - Efficient process – heat, which would otherwise be a wasted byproduct of electricity generation, is used to produce more steam and hot water
- Burned last lump of coal in November 2014
 - Stack and coal silo demolished in Spring 2015
 - Construction completion estimated Fall 2015
- Now uses 100% natural gas
 - Fuel oil backup in case natural gas unavailable in event of an emergency
 - VUMC is a major regional Level 1 Trauma Medical Center and Children’s hospital, and also houses important experiments and biomedical research
 - It is essential these be powered by reliable, uninterruptable energy supply at all times
- Several reasons to upgrade the power plant
 - Age of the existing boilers – old boilers were reaching the end of their expected life cycle
 - Improved operational efficiency – natural gas provides cleaner, more reliable, more efficient power
 - Return on investment – estimated payback of 10 years
 - Improved visual aesthetic of campus – stack longer prominent feature of campus skyline
 - New and proposed environmental regulations – conversion puts us ahead of the curve in meeting new regulations
 - Environmental impact improvements – reduced:
 - GHG emissions
 - Air pollutant emissions
 - Solid waste production
 - Noise pollution
 - Transportation emissions associated with trucking coal
- 40% greenhouse gas emissions decrease
- 50% decrease in particulate matter and virtual elimination of other air pollutants such as hydrogen chloride, mercury, sulfur dioxide, nitrogen dioxide, carbon monoxide, and particulate matter
- 105 million pounds of coal no longer used every year
- 15 million pounds of ash waste no longer produced every year

3:15-3:30 Water break at Sarratt Promenade

3:30-3:45 Alumni Hall – LEED Gold

- Originally built in 1924
- Renovated in 2012
- Renovation is still awaiting LEED Certification
- Reused significant portions of existing building
- Included existing floors, millwork, and historic windows
- Windows maximize daylighting and provide unobstructed views from almost every room in the building
- New materials installed into project have a high recycled content
- Location provides access to various services
- Public transportation very close
- Bicycle racks and showers facilities inside building
- 50% diversion of construction waste from the landfill
- Project includes low flow fixtures and motion-sensing faucets to reduce water use
- Energy optimization provided by:
 - Intelligent lighting controls
 - Daylighting from ample windows
 - Natural shading from existing trees
 - High efficiency, variable refrigerant flow, water-cooled heat pumps
- Low-VOC materials used in all aspects of construction
- Uses campus-wide green cleaning program for housekeeping

3:45-4:00 Warren and Moore – LEED Gold

- Vanderbilt’s largest LEED certified building at 395,000 sq. ft.
- 7th largest LEED certified building in Middle TN
- Largest certified multi-unit higher education residence building in the state of TN
- Opened to students 2013 – houses 600 upper-class students
- Access to public transportation/alternative transportation
- Bike storage and changing rooms
- 44% reduction in building water use
- Motion-sensing, low-flow sinks and toilets
- Adjustable pressure showers
- 59% reduction in irrigation water use by installing the Rainbird IQ smart irrigation system.

- Native landscaping that requires little irrigation
- 29% cost savings by design(compared to ASHRAE 90.1-2007 baseline)
- 83% construction waste diverted from the landfill
- 25% recycled content in materials (by cost)
- 38% regional materials used (by cost)
- Low-VOC materials used in all aspects of construction
- 91% of spaces have direct line of sight to outdoors (of regularly occupied spaces)
- Use of Low Mercury Fluorescent Lights
- High performance glass that reduces heat transfer
- Individually controlled thermostats to conserve energy